

Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

1.972

A2B74

UNITED STATES
DEPARTMENT OF AGRICULTURE
LIBRARY



BOOK NUMBER 1.972
A2B74

665417

74

AGRICULTURAL RESEARCH ADMINISTRATION
Bureau of Animal Industry

BREED FOR BETTER EGGS

by

Joseph P. Quinn and Edmund H. McNally

Select and breed to improve egg quality because several market egg characteristics are known to be heritable. Daughters of hens that lay large eggs usually lay eggs of good size. Daughters of hens that lay good shelled eggs generally lay eggs with good shells. But a hen should be judged on the performance of her daughters rather than on her own record. And the breeding value of cockerels and pullets should be based on the performance of their sisters. Progeny testing and sib-testing are fully as important in breeding for better eggs as in breeding for large numbers of eggs.

Improvement in egg shape, egg weight, shell quality, shell color, amount of thick white, and keeping quality of thick white will definitely enhance market egg quality. Each of these market egg characteristics has proved to be an inherited trait. On the other hand, certain exterior and interior defects, also inherited, may affect egg quality adversely. So we should select and breed for desirable egg qualities and select against defects.

BREED FOR EGG SHAPE

A fairly round egg, tapering gradually from large to small end, is the most satisfactory egg shape. Long, pointed eggs get chopped off or mowed down. Round, fat eggs won't fit standard fillers. Abnormal shaped eggs often have shells of poor texture.

Egg shape can be easily changed by a few years of careful selection directed toward the desired goal. There will always be some minor variations because no two eggs laid by the same hen are molded in exactly the same way. But shape can be definitely changed as shown by breeding investigations. At Pennsylvania State College two lines, differing distinctly in egg shape, were developed; a round egg line, and a long egg line. The lines were easily established and the uniformity of the progeny suggested that a limited number of genes were involved.

BREED FOR EGG WEIGHT

Egg size pays off because higher prices are obtained for Grade A eggs than for Grade B or Grade C eggs. Remember that daughters of small-egg hens will lay small eggs and daughters of large-egg hens will lay large eggs. Eggs 20 ounces or less and eggs 27 ounces or more in weight, do not hatch as well as medium sized eggs, as a rule. And there is no profit in getting eggs too large to be packed in the ordinary container. Many producers complain that AA eggs for size bring only A prices, so let's not overdo and deliver too much.

Breeders have done a good job in breeding for egg size but there are many good producing flocks in which small egg size is a chronic eye sore. In such cases, breed for increased egg weight as did the Beltsville egg breeders. Over a five year period, they raised average egg weight from 23.2 ounces to 25.4 ounces per dozen. And they advanced the date when the pullet eggs reached standard weight from May to December.

BREED FOR SHELL QUALITY

When the flock produces strong shelled eggs, producers can market the entire egg crop. So why not improve shell quality permanently by breeding from hens that lay strong shelled eggs in summer as well as in winter? Many hens lay good shelled eggs in the winter months but porous, rough, thin shelled eggs in the summer and fall. Don't breed such hens! Breed only hens that lay eggs with good, heavy shells in summer as well as in winter. August, September and October are good months to select these breeders.

Egg breeders at the Agricultural Research Center, Beltsville, Maryland, have developed two lines of birds that differ widely in shell quality. In the poor shell line about three and one-third times as many eggs were cracked and broken, in routine handling, as in the good shell line. The two lines have been developed by selection based on loss in egg weight, an excellent measure of shell quality and a heritable characteristic. Use the egg-weight loss method to select breeders.

Shell color is also inherited. Crosses between white egg and brown egg varieties lay light brown, tinted, or cream colored eggs. Shell color may be associated with shell thickness. Shell color is important in some markets; in others, not.

BREED FOR THICK WHITE

Eggs with a high percent of thick white stand up well when broken out. Eggs with a low percent of thick white appear excessively watery. A high thick white egg is more satisfactory for poaching because a large amount of thick white supports and covers the yolk. Because excessive heat exposure liquefies the thick white, many suppose that a watery egg has deteriorated. This is not necessarily true as the watery egg may be a result of heredity. What the consumer likes is a high thick white which gives the egg an upstanding appearance. He knows that such an egg is a fresh egg.

The high thick white line at Beltsville averages 65 percent thick white; the low line 40 percent. Reciprocal crosses of these two lines averaged 54 percent, the amount found in the average egg.

BREED FOR KEEPING QUALITY

Consumers prefer eggs with a high percentage of thick white for psychological and culinary reasons. But they also want keeping quality.

A good shell helps to maintain keeping quality by reducing weight loss as we have seen. And within the egg, a durable, non-deteriorating thick white will continue to surround and support the yolk as long as the white holds together. In short, eggs keep better when the thick white is resistant to heat and other deteriorating influences.

Beltsville egg breeders have developed a heat-resistant type of thick white in a flock of White Leghorns by 7 years of breeding. This type of thick white holds together very well for about 14 days at 100°F. and is a great improvement over the ordinary thick white, which retains its initial quality for only a very short period.

BREED TO REDUCE BLOOD SPOTS

Blood spots in eggs are quite common. Surveys of farm flocks have shown that incidence of blood spots ranges from 15 to 50 percent. As a rule, the eggs laid by White Leghorns have fewer blood spots than the eggs of the heavy varieties. At the Western New York Egg Contest blood spots ranged from 15 percent in White Leghorns to 58 percent in New Hampshires. But since the percentage of blood spots depends on hereditary factors, any variety may produce eggs with a high or low percentage of blood spots.

At Beltsville the incidence of blood spots ranged from 61 percent in Rhode Island Reds to 4 percent in White Leghorns. Light Sussex and White Wyandotte eggs averaged about 32 percent blood spots. Crosses of White Leghorns and White Wyandottes were intermediate, their eggs averaging about 18 percent blood spots. Two lines of Rhode Island Reds have been bred at Beltsville, one line producing eggs which average 80 percent of blood spots, the other 20 percent. The development of the two lines shows clearly that blood spots are due to heredity, and that incidence of blood spots may be greatly reduced by breeding.

BREED FOR TOP EGG QUALITY

Combine all heritable egg quality characteristics in a 200-egg hen. This means egg shape, egg weight, shell quality, shell color, a large amount of thick white, a heat-resistant thick white, and freedom from exterior and interior defects.

BREED FOR GOOD SHELLS

LOW
WEIGHT
LOSS



GOOD THICK SHELL

HIGH
WEIGHT
LOSS

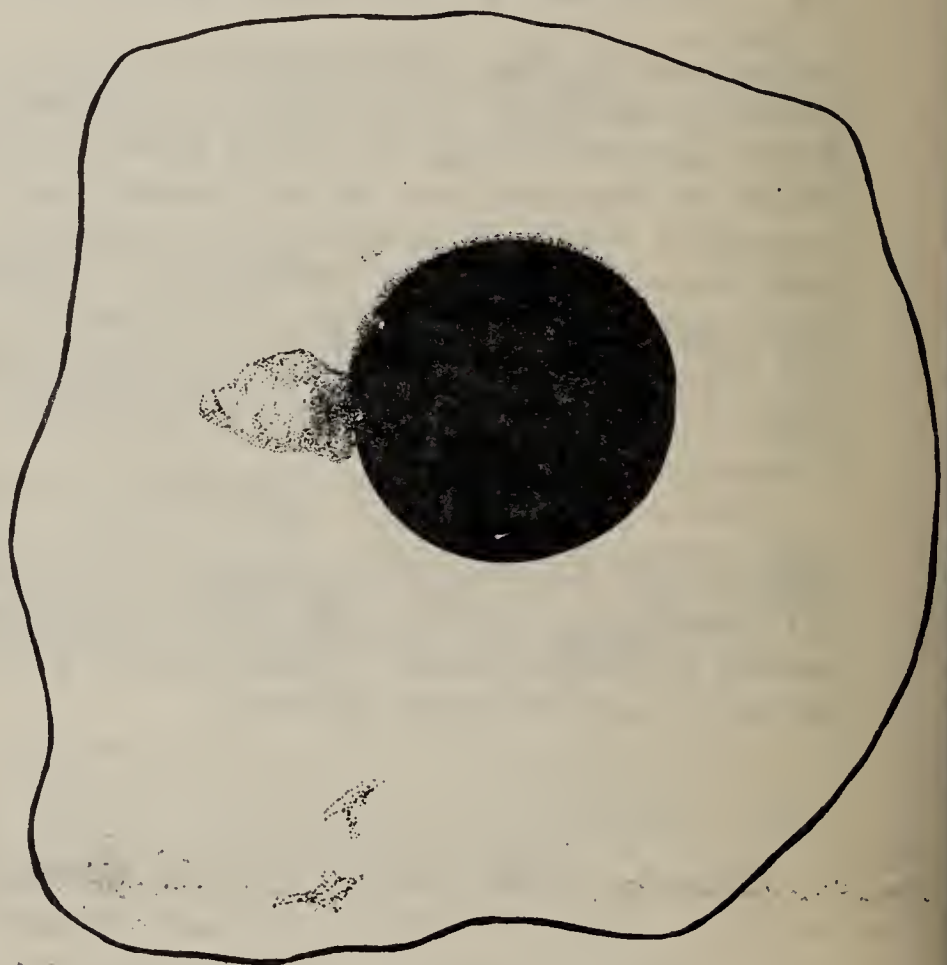


THIN POROUS SHELL

BREED FOR HEAT-RESISTANT THICK WHITES



HEAT-RESISTANT



NOT HEAT-RESISTANT

EGGS INCUBATED 14 DAYS

